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A REVISION OF THE GENUS
SYNECHES WALKER
(DIPTERA: EMPIDIDAE)
FOR NORTH AMERICA AND THE ANTILLES

by
D. Dee Wilder

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By

D. Dee Wilder²

ABSTRACT

The genus *Syneches* Walker is reviewed. A diagnostic key and illustrations of wings, male genitalia and legs are presented for the identification of the seventeen species of *Syneches* known from North America and the Antilles. Twelve species are redescribed and the following species described as new: *S. frosti* from Florida, *S. pallidus* from Jamaica, *S. macrochaetus* from Puerto Rico, *S. vittatus* from the southwestern United States, *S. vineus vineus* from Dominica, W. I., *S. vineus medinai* from Puerto Rico, and *S. vineus jamaicensis* from Jamaica. *Gloma phthia* and *S. testaceus* are for the first time listed as synonyms of *S. thoracicus*.

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Michigan (UMMZ); University of Nebraska (DEUN); U.S. National Museum (USNM); University of Wisconsin (UWEM); British Museum (Natural History) (BMNH).

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INTRODUCTION

The genus *Syneches*, included in the subfamily Hybotinae, was erected by Walker in 1852 for the North American species *simplex* Walker. The genus is now known to be world wide in distribution, occurring in North America primarily east of the Rocky Mountains. The group has been divided into subgenera, but according to Smith (1969) the division does not hold up on a world basis. *Syneches*, sens. str. is the only subgenus known in the Western Hemisphere.

Of the available specimens belonging to this genus, many could not be identified because of poor keys and inadequate descriptions. There were also numerous species which were undescribed. This study was undertaken with the objective of producing a key and a set of descriptions to simplify the identification of all known North American and West Indian *Syneches*.

Genus *Syneches* Walker

Damalis Fabricius, 1805, Syst. Antliat., p. 147. Type species, *curvipes* Fabricius (Westwood, 1835 Ann. Soc. Ent. France 4: 684).

Syneches Walker, 1852, Ins. Saund. Dipt. 1: 165. Type species, *simplex* Walker.

Pterospilus Rondani, 1856, Dipt. Ital. 1: 152. Type species, *Hybos muscarius* Fabricius.

Syneches, subgenus *Harpamerus* Bigot, 1859, Rev. Mag. Zool. 11: 306 (as genus).
Type species *signatus* Bigot.

Syneches, subgenus *Epiceia* Walker, 1860 Proc. Linn. Soc. Lond. 4: 149. Type species, *ferruginea* Walker.

The genus *Damalis* Fabricius originally included four species; two of these were empidids and two asilids. Wiedemann (1823) placed the two asilids in *Damalis* and the two empidids in the genus *Hybos*. Westwood (1835) designated *D. curvipes*, one of the empidids, the type species of the genus.

Hull (1962) proposed continuance of the name, *Damalis*, in the Asilidae, "because the mass of literature has, with only one or two exceptions, continued to treat these

asilids under the name *Damalis*, and because students of the Empididae have uniformly rejected the name *Damalis*."

Flies belonging to the genus *Syneches* are quite distinctive and can be separated from all other empidids by the following characteristics:

Head hemispherical, occiput flattened; eyes meeting from antennae to prominent ocellar triangle; antennae two-segmented, basal segments fused, outer segment oval with apical or subapical hair-like arista.

Thorax very highly arched, scutellum margined with many hair-like bristles.

Legs hairy; hind femora usually somewhat enlarged and spinose beneath, always with several flexor bristles.

Wings with anal angle usually strongly rectangular, pedicel of second and third veins long.

BIOLOGY

There is no recorded information on the immature stages of any hybotine empidids. It is assumed, as with most other empidids, that the larvae are predaceous, living in soil, leaf litter or rotting wood.

Schwartz (1891) has described the feeding behavior of an undetermined species of *Syneches*. This predaceous behavior has since been observed by the writer and is described in detail under *thoracicus* (Say).

Species of the genus *Syneches* have been considered to be insects of grassland areas. While this is undoubtedly true of some species such as *simplex* Walker, which has been collected by sweeping in grassland areas, it does not hold for others. The writer has collected *thoracicus*, *pusillus* Loew and *rufus* Loew only in lush forest vegetation. Ecological data on labels indicate that *vineus* n. sp. and *macrochaetus* n. sp. are also forest inhabiting species.

It might be added that *Syneches* as well as many other empidids are easily collected at lights, to which they often come in very large numbers.

MORPHOLOGY

Earlier descriptions and keys to species of the genus *Syneches* have relied largely on color as the main character. This is unfortunate since many of the species are especially variable in color. There are several more stable characters which are useful in separating the species; a short explanation of some of these follows.

The length of the hairlike arista is quite consistent within a species. The arista is usually curved, and as a result is difficult to measure. For this reason, the arista length is used in the descriptions only when necessary, and then only as the ratio of arista to third antennal segment length. The apical antennal segment is called the third antennal segment even though the two basal joints are fused.

On the occiput is a v-shaped depression in many species which extends from the ocellar prominence to the cervix, herein termed the *posterior ocellar depression*. Occasionally there is a polished dorsoventral band in the same area, termed the *posterior ocellar polished band*.

A very consistent character is the extent of polished areas on the pleuron. When colors or patterns of natal pollen are used, the insect should be examined from several different angles.

Terminology for naming wing veins and cells is conventional (Figure 3).

The legs in most of the species considered in this paper are quite hairy. Therefore when looking for certain bristles on the legs, one must be careful to distinguish between spines, bristles and hairs, bristles being stiffer and longer than hairs.

The fore tibiae of all *Syneches* bear a depression on the anterodorsal basal third, the *fore tibial depression*. Smith (1969) calls this a "gland-like leg structure."

All *Syneches* considered in this revision have long hairs on the abdomen. These hairs are shorter dorsally and longer laterally. They are also longer on the anterior and posterior margins of abdominal segments, and are absent on the posterior half of the first abdominal segment.

Although the male genitalic characters in this group are somewhat variable, they are still fairly diagnostic. Unfortunately, the genitalia must be removed and macerated before the important features are sufficiently visible. The most constant structures within each species are the apical margin of the epandrium and the general shape of the hypandrium; however species with wide geographical ranges may show considerable variation in these characters, especially at the extremes of their ranges.

KEY TO THE SPECIES OF *SYNECHES* FOR NORTH AMERICA AND THE ANTILLES

1. Wings with dark spot beyond tip of second vein
(Figure 59) *simplex* Walker
- Wings without dark spot beyond tip of second vein 2
2. Hind femora swollen compared with middle femora, with numerous bristles below and usually with short, stout spines; body usually longer than 4 mm 10
- Hind femora not swollen, similar to middle femora, at most 5 strong bristles below, body usually less than 4 mm. in length 3
3. Wings with a well-defined stigma 4
- Wings without well-defined stigma 5
4. Thorax black; stigma grey, filling marginal cell to apex *vineus* *vineus* n. sp.
- Thorax brown; stigma dark brown, quadrate, not filling marginal cell to apex *quadrangularis* Wheeler and Melander
5. Abdomen dusted brown, apical band on each segment grey pollinose; hind femora dark brown; Arizona, New Mexico *vittatus* n. sp.
- Abdomen brown, apical bands, if present, very narrow 6

6. Thorax yellow to light brown; hind legs yellowish with dark femoral-tibial joints, a dark band at middle of tibiae, and dark basitarsi and distitarsi (Figure 6) *debilis* Coquillett
 Thorax dark brown to black; hind legs not conspicuously banded 7
7. Second vein slightly curved at apex of first vein; ratio of marginal cell to submarginal cell at apex of first vein approximately 1/1.5 8
 Second vein straight at apex of first vein; ratio of marginal cell to submarginal cell at apex of first vein approximately 1/1 10
8. Hind femora dark brown to black, Dominica *vineus vineus* n. sp.
 Hind femora yellow to light brown 9
9. Hypandrium without median apical notch, female unknown,
 Puerto Rico *vineus medinai* n. ssp.
 Hypandrium with median apical notch,
 Jamaica *vineus jamaicensis* n. ssp.
10. Arista less than five times length of third antennal segment; wings dark brown (Figure 60) *ater* Melander
 Arista five or more times length of third antennal segment; wings light brown to hyaline (Figure 56) *pusillus* Loew
11. One notopleural, one supraalar bristle present 12
 Two notopleural, no supraalar bristles present 15
12. Stigma short, quadrate or oval, distinct 13
 Stigma elongate, indistinct, nearly filling apex of marginal cell (Figure 3) *inversus* Curran
13. First posterior cell markedly wider at wing margin than at anterior crossvein, legs not banded 14
 First posterior cell not widened at wing margin (Figure 62), legs banded (Figure 13) *pallidus* n. sp.
14. Thorax yellow with golden pollen; middle tibiae without long ventral bristle at basal third, Jamaica *bacis* (Walker)
 Thorax brown with brown pollen and silvery pollinose longitudinal mesoscutal stripes; middle tibiae with long ventral bristle at basal third (Figure 14), Puerto Rico *macrochaetosus* n. sp.
15. Stigma distinct, much darker than wing 16
 Stigma diffuse or not much darker than wing 18
16. Stigma quadrate; legs yellow, hind femora, tibiae and basitarsi brown apically *quadrangularis* Wheeler and Melander
 Stigma round or oval; color of legs variable, hind femora, tibiae and tarsi never distinctly darker apically 17
17. Stigma elongate oval; ratio of marginal cell to submarginal cell at apex of first vein 1.5/1 or less (Figure 51) *thoracicus* (Say)
 Stigma round to oval; ratio of marginal cell to submarginal cell at apex of first vein 2.5/1 or more (Figure 52) *rufus* Loew

18. Notum dark brown dusted with grey and brown stripes, legs
largely yellow 20
- Notum, if dark, usually without distinct grey and brown stripes;
legs light to dark brown 19
19. Hind tibiae tuberculate ventrally; white pollinose humeral
patches absent *longipennis* Melander
- Hind tibiae not tuberculate; white pollinose humeral patches
present *albonotatus* Loew
20. Sternopleura not polished; femoral-tibial joints dark brown (Figure 11);
fore tibial depression dark brown *frosti* n. sp.
- Sternopleura partly polished; femoral tibial joints only slightly darker
than rest of leg; fore tibial depression yellow *hyalinus* Coquillett

Syneches simplex Walker

Figures 10, 30, 37, 59

Syneches simplex Walker, 1852, Ins. Saund., Dipt. 1: 165.

Syneches punctipennis van der Wulp, 1867, Tijdschr. v. Ent. 10: 139.

Head reddish brown to black, grey pollinose; posterior ocellar depression rectangular, posterior ocellar polished band present. Two long and two to four shorter ocellar bristles. Antennae yellow to black, third segment usually black at base, yellow at apex, arista bare.

Thorax yellow to black; northern specimens grey or brown pollinose, sometimes with greyish pollinose mesoscutal stripes, southern specimens gold and silvery pollinose, variously patterned. Pollen at base of dorsocentral bristles darker than that of remainder of thorax. Integument of humeri of dark specimens yellow. Numerous, more than six, humeral bristles; two subequal notopleurals; one long and two minute postalars. Pleurae yellow to brown pollinose, except for small polished spot on sternopleuron. Halteres brown to black, stem usually lighter.

Wings 3-4 mm. long, subhyaline to brown; stigma small, brown, located at end of first vein; another small brown spot at end of second vein. Second vein straight below end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell less than twice as wide as submarginal cell at end of first vein.

Legs yellow to black, tibiae and tarsi often lighter. Middle tibiae with one anterodorsal and two apical bristles. Hind femora without anterodorsal bristles, below usually with six to seven stiff hair-like bristles. Hind tibiae with one prominent anterodorsal and numerous subapicals.

Abdomen yellow to black, brown to gold pollinose; abdominal hairs yellow to brown. Abdomen of females frequently lighter than thorax. Male genitalia as figured (Figures 30, 37).

Type locality and type: "United States." Type deposited in British Museum, apparently lost.

Distribution: This is perhaps the most commonly collected species of *Syneches*. Over 750 specimens have been examined from eastern North America, ranging from Nova Scotia to Florida west to Galveston, Texas and north to Elbow, Saskatchewan; two specimens from Logan, Utah.

Flight period: January to December in southern parts of range, May to October in northern parts of range.

Remarks: This species, the type species of the genus, bears no close relationship to any other North American species. It is easily distinguished by the wing spot beyond the end of the second vein.

Melander (1928) states that, according to Dr. S. W. Williston, *simplex* was described in 1849 as *Gloma phthia* Walker. Mr. Kenneth G. V. Smith, who has examined the type of *phthia* in the British Museum (Natural History), has stated (1962, 1971) that the two insects are distinct. Examination of a wing photograph of the type of *phthia* has shown it to be conspecific with *thoracicus*, described by Say in 1823. Based on this information, *phthia*, the name used in place of *simplex* since 1928, is now placed in synonymy with *thoracicus*.

This species has been collected by the writer by sweeping grassy areas near forests. It also may be commonly collected at lights. Hundreds of specimens were collected from 26 June to 1 September 1971 at greenhouse lights situated near a forest and a large grassy field in Michigan. It is interesting to note that exhaustive sweeping and searching yielded no specimens during the daylight hours at this locality.

Syneches hyalinus Coquillett
Figures 27, 36, 63

Syneches hyalinus Coquillett, 1895, Proc. U.S. Natl. Museum 18: 437.

Head dark reddish brown, grey pollinose; posterior ocellar depression present. Two long and six short pale ocellar bristles. Antennae yellow to rufous, third segment with short grey pubescence; arista subdorsal, more than five times length of third antennal segment, pale, finely pubescent except for extreme apex.

Thorax light to dark brown, greyish pollinose except for three longitudinal mesoscutal stripes and a lateral spot with brown pollen. Pollen on prescutellar triangle flattened, the spot contrasting with rest of notum when viewed from different angles. Integument of postalar calli lighter than that of notum, pollinosity similar. Three weak humeral bristles; two notopleurals, posterior slightly longer; three postalars, one long and two minute. Pleurae grey pollinose except for large polished spot on sternopleuron. Halteres brownish, stem lighter.

Wings 4-4.5 mm in length, hyaline to light brown; stigma indistinct, pale brown, filling marginal cell from before end of first vein to end of second vein. Second vein nearly straight beneath end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell less than twice as wide as submarginal cell at end of first vein.

Legs yellow to brownish yellow, yellow haired; coxae darker, dusted greyish. Anterodorsal bristle of middle tibiae brown, shorter than or subequal to posterior notopleural; apical posteroventral slightly shorter, light brown to yellow. Hind femora enlarged with two or three anterodorsal bristles; below usually with two or

three, rarely four or five, spines on basal half. Hind tibiae with two subequal anterodorsal bristles, both longer than femoral bristles; one long, usually pale, posterodorsal at level of second anterodorsal.

Abdomen brown, brown pollinose, except first segment with grey pollen, abdominal hairs pale. Genitalia as figured (Figures 27, 36).

Type locality and type: *Holotype*.—♀, Maryland, Type No. 3240 in U.S. National Museum.

Records: MARYLAND. 1♂, Riverdale, Prince Georges Co., 11 June 1916 (F.R. Cole). 1♂, Hyattsville, Prince Georges Co., 2 Aug. 1908 (A.L. Melander). 1♂, College Park, Prince Georges Co., 25 July 1937 (C. T. Greene). NEW YORK. 7♂♂, Babylon, L.I., Suffolk Co., 13 July 1937 (F. S. Blanton); 2♂♂, 26 July 1933 (Blanton and Borders). 1♀, Jones Beach, L. I., Suffolk Co., Aug. 1963 (W. Sikora). NEW JERSEY. 1♂, 2♀♀, Malaga, Gloucester Co., 4 Aug. 1907 (C. T. Greene). 6♂♂, Avalon, Cape May Co., 22 July 1894 (C. W. Johnson). 1♀, Westville, Gloucester Co., 21 July 1896 (C. W. Johnson). 1♀, Pemberton, Burlington Co., 11 July 1909 (C. T. Greene). 1♂, Cape May Co., 3 Aug. (C. W. Johnson). VIRGINIA. 2♂♂, Cape Henry, Princess Anne Co., 28 June 1939 (A. L. Melander). 1♂, 1 mile S.E. of Lanoka, New Kent Co., 1-6 July 1956 (N. D. Richmond). NORTH CAROLINA. 1♂, Smithfield, Isle of Wight Co., 7 July 1946 (M. W. Wing). GEORGIA. 1♂, Whitmarsh Island, Chatham Co., 28 June 1958, (C. F. Hartley). 1♂, Ft. Stewart Area, 25 June 1956 (C. F. Hartley). FLORIDA. 1♂, Ft. Myers, Lee Co., 27 Feb. 1918 (Blatchley). 1♂, Torreya St. Park, Liberty Co., 20 May 1966 (H. V. Weems, Jr.); 1♀, 4 July 1965. 2♂♂, Gainesville, Alachua Co., 9 Sept. 1964 (R.P. Esser).

Remarks: This species is very closely related to *S. frosti* n. sp., from which it is easily distinguished by yellow femoral-tibial joints, smaller upper eye facets and the polished spot on the sternopleuron. Some specimens of *longipennis* Melander and *albonotatus* Loew may resemble this species, but *hyalinus* may be separated from the former by the non-tuberculate hind tibiae and from the latter by possessing yellow, instead of brown legs.

Data on labels indicate that this species is attracted to lights.

Syneches frosti n. sp.

Figures 11, 19, 46, 65

Head dark reddish brown, grey pollinose; posterior ocellar depression present. Two long and six short pale ocellar bristles present. Antennae rufous to brown, third segment with long grey pubescence; arista apical, less than five times length of third antennal segment, pale, densely pubescent except for dark base and apical fifth.

Thorax light brown to black, grey pollinose, except for three longitudinal mesoscutal stripes and two lateral, nearly confluent spots with brown pollen. Pollen on prescutellar triangle flattened, the spot contrasting with rest of notum when viewed from different angles. Integument of postalar calli lighter than that of notum, pollinosity similar. Three weak humeral bristles; two dark notopleurals, posterior slightly longer; three postalars, one subequal to anterior notopleural and two minute. Pleurae grey pollinose. Halteres brownish, stem lighter.

Wings 4.5-5 mm in length, hyaline; stigma, if visible, pale yellow. Second vein nearly straight beneath end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell at end of first vein less than twice as wide as submarginal cell at same point.

Legs yellow to brownish yellow, yellow haired; coxae darker, dusted greyish; apices of femora, bases of tibiae and fore tibial depression dark brown. Anterodorsal bristle of middle tibiae brown, subequal to or slightly longer than posterior notopleural; apical posteroventral bristle slightly shorter, light brown to yellow. Hind femora enlarged with three to five anterodorsal bristles, below with two to five spines on basal half. Hind tibiae with two anterodorsal bristles, both subequal to or slightly longer than longest femoral bristle; one long pale posterodorsal at level of second anterodorsal.

Abdomen brown, brown pollinose, first segment grey pollinose; abdominal hairs pale. Genitalia as figured (Figures 19, 46).

Type locality and type: *Holotype*. —♂, Florida, Archbold Biological Station, Highlands Co., 10 Feb. 1962 (S. W. Frost). Type No. 72141 in U.S. National Museum.

Allotype. —♀; same data as holotype (USNM).

Paratypes. Same data as holotype with following dates: 3♂, 1♀, 10 Feb. 1962; 1♀, 11 Jan. 1962; 1♂, 14 Jan. 1962; 1♂, 17 Jan. 1962; 1♀, 18 Jan. 1962; 1♂, 23 Jan. 1962; 1♂, 26 Jan. 1962; 1♂, 2 Feb. 1962; 1♂, 4 Feb. 1962; 1♂, 5 Feb. 1962; 4♂♂, 1♀, 8 Feb. 1962; 2♂♂, 24 Feb. 1963; 1♂, 27 Feb. 1963; 2♂♂, 4 March 1963; 1♂, 6 March 1962; 1♂, 10 March 1963; 1♂, 11 March 1963; 1♂, 12 March 1963; 1♂, 13 March 1963; 1♀, 23 March 1962; 1♂, 1♀, 24 March 1963; 2♀♀, 30 March 1963; 6♂♂, 1♀, 1 April 1963; 1♂, 6 April 1963; 1♀, 8 April 1962; 1♂, 13 April 1963. 1♂, 1♀, Archbold Biological Station, 10 May 1965 (L. L. Pechumen). 1♀, Archbold Biological Station, 23 April 1967 (B. V. Peterson). 1♀, Gainesville, Alachua Co., 28 May 1959 (H. V. Weems, Jr.). Paratype distribution: 2♂♂, 2♀♀ (CNCI); 2♂♂, 2♀♀ (MSUC); 2♂♂, 2♀♀ (FSCA); 1♂, 1♀ (CUIC); 1♂, 1♀ (BMNH); remainder (USNM).

Remarks: This species is closely related to *hyalinus* Coquillett, but is distinct in having upper eye facets larger, sternopleuron entirely pollinose and apices of femora and bases of tibiae dark. Some specimens may resemble *longipennis* and *albonotatus*, but differ from the former by the non-tuberculate hind tibiae and from the latter by virtue of the largely yellow legs.

Syneches frosti n. sp. has been collected exclusively at lights.

This species is named in honor of Dr. Stuart W. Frost, who collected the majority of the specimens examined, and whose enthusiasm has been a continuing inspiration to the writer.

Syneches albonotatus Loew
Figures 18, 33, 57

Syneches albonotatus Loew, 1862, Berl. Ent. Zeitsch. 6: 195.

Head dark reddish brown, grey pollinose; posterior ocellar depression present. Two long and two (rarely four) shorter ocellar bristles. Antennae rufous to brown, third segment with short grey pubescence; arista subdorsal, five times the length of third

antennal segment or longer, brownish with fine golden pubescence except for extreme tip.

Thorax dark brown to black, rarely light brown, greyish pollinose, usually with two to three longitudinal mesoscutal stripes and a large side spot with brown pollen. Humeri, two large posthumeral patches and prescutellar triangle with pollen flattened, these areas contrasting with rest of notum when viewed from different angles. Integument of postalar calli lighter than that of notum, pollinosity similar. Four, rarely three, weak humeral bristles; two dark notopleurals, posterior longer; three postalars, one long and two minute, Pleurae grey pollinose except for polished spot on sternopleuron. Halteres brown to dark brown, stem slightly lighter.

Wings 4.5-5 mm long, brown; stigma varying from pale to dark brown, with indistinct posterior borders, nearly filling apex of marginal cell. Second vein nearly straight beneath end of first vein; third and fourth veins parallel beyond end of discal cell. Marginal cell acute at distal end; slightly wider at end of first vein than submarginal cell at same point.

Legs dark reddish brown to nearly black, rarely light brown; brown haired; tibiae and tarsi occasionally light brown, coxae dusted greyish. Anterodorsal bristle of middle tibiae brown to black, variable in length; posteroventral dark, also variable. Hind femora enlarged with two to three anterodorsal bristles on apical half, below with abundant long spines, usually six or more on basal half. Hind tibiae with two anterodorsal bristles both shorter than longer femoral bristles; subapical posterodorsal longer than anterodorsals.

Abdomen brown to black, brown pollinose, first segment grey pollinose; abdominal hairs pale. Genitalia as figured (Figures 18, 33).

Type locality and type: *Holotype*. —♀, District of Colombia, Type No. 1112 in Museum of Comparative Zoology, Harvard University.

Records: NEW JERSEY. 1♂, Basking Ridge, 9 June 1936 (W. R. Douglas). PENNSYLVANIA. 1♀, Westmoreland Co., July. VIRGINIA. 1♀, Falls Church, Fairfax Co., 24 June 1912 (C. T. Greene). GEORGIA. 1♂, 1♀, Austell, Cobb Co., 27 Aug. 1910 (C. W. Johnson). FLORIDA. 1♂, Gainesville, Alachua Co., 28 May 1959 (H. V. Weems, Jr.). OKLAHOMA. 6♂♂, 1♀, Pawhuska, Pawnee Co., 10 June 1960 (G. C. Eickwort and W. T. VanVelzen). TEXAS. 1♂, 2.5 miles S. W. of Forestburg, Montague Co. 28 April 1951, (CNMH Paleont. Exp., Patterson leg.). 1♂, Dallas, Dallas Co., 3 May (Osten Sacken).

Remarks: This species can be separated from *hyalinus* and *frosti* by the dark hind femora, and from *longipennis* by the nontuberculate hind tibiae. It is also distinguishable by the white pollinose humeral patches, which can be seen only when the insect is held at certain angles.

Despite the disjunct distribution, these specimens unquestionably belong to the same species. The specimens from Texas and Oklahoma are darker in color than the others, and have a slightly different shape to the hypandrium.

This species has been collected at lights as well as on Elm and the blossoms of *Rhus*.

Syneches longipennis Melander
Figures 20, 45, 49

Syneches longipennis Melander, 1902, Am. Ent. Soc. Trans. 28: 346.

Head brown to dark reddish brown, grey pollinose; posterior ocellar depression present. Two long and two short ocellar bristles. Antennae yellow to brown with short greyish pubescence; arista subdorsal, usually six times length of third antennal segment, pubescent, sometimes finely plumose, except for base and hair-like apex.

Thorax light brown to dark reddish brown, pale pollinose, some specimens with three to four golden pollinose mesoscutal stripes, others with a dark median integumental stripe. Pollen on prescutellar triangle flattened, the spot contrasting with remainder of notum when viewed from different angles. Three humeral bristles; two notopleurals, posterior markedly longer; four postalars, one long and three very small. Pleuron pale pollinose except for large polished area on sternopleuron which extends to ventral edge of mesopleuron. Halteres brownish, stem usually lighter.

Wings 6 mm. in length, light to dark brown; stigma usually indistinct, pale brown, filling marginal cell from before end of first vein to end of second vein. Second vein but slightly curved beneath end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell at end of first vein slightly wider than submarginal cell at same point.

Legs brownish yellow to brown, coxae pale pollinose. Anterodorsal bristle of middle tibiae brown to black and longer than notopleurals; apical posteroventral subequal to posterior notopleural, brown. Hind femora of males greatly swollen, usually as wide as abdomen; of females, not quite as swollen; with four to five strong anterodorsal bristles; below with numerous long, stout spines, especially in males. Hind tibiae with small tubercles on the ventral surface; two subequal anterodorsal bristles, both considerably shorter and more slender than longer femoral bristles; and posterodorsal slightly longer than anterodorsals.

Abdomen light to dark brown, pollen varying in color from golden to grey; abdominal hairs pale to dark. Genitalia as figured (Figures 20, 45).

Type locality and type: *Holotype*. —♂, North Carolina, Hertford Co., 9 June 1895 (C. W. Johnson). Type in U.S. National Museum.

Records: GEORGIA. 1♂, Burton, 21 May 1911, 1800 ft. alt. (D. C. Bradley). ALABAMA. 1♂, Thomasville, Clarke Co., 20 April 1910 (W. D. Pierce). TENNESSEE. 1♂, Allardt, Fentress Co., c. 1200 ft., 13 June 1924 (T. H. Hubbell). MISSISSIPPI. 1♂ 1♀, Tishomingo State Park, Tishomingo Co. 31 May 1958 (T. E. Moore).

Remarks: This species can be distinguished from all other North American *Syneches* by the presence of small tubercles on the ventral surface of the hind tibiae and by the greatly swollen, spinose hind femora.

Although most specimens have three humeral bristles, the holotype appears to have only two. This species exhibits a large range of variation in shape of the hypandrium and epandrium.

Syneches rufus Loew
Figures 8, 17, 34, 52

Syneches rufus Loew, 1861, Berl. Ent. Zeitsch. 5: 320.

Head light to dark reddish brown, grey pollinose; posterior ocellar depression present. Two long and two shorter ocellar bristles. Antennae yellow to reddish brown, arista yellow, pubescent except for apex.

Thorax yellow to dark brown, yellowish to brown pollinose, longitudinal mesoscutal integumental stripe sometimes present. Three to five small humeral bristles; two, rarely three, notopleurals of varying lengths; one long and one or two minute postalars. Pleurae yellow to brown pollinose except for polished sternopleuron and mesopleuron. Halteres yellow to brown, stem sometimes lighter.

Wings 4.5-5 mm in length, hyaline to light brown; stigma round to oval, pale yellow to brown, never filling apex of marginal cell. Second vein curved below end of first vein; third and fourth veins nearly parallel beyond discal cell. Marginal cell greater than 2.5 times as wide as submarginal cell at end of first vein.

Legs yellow to dark brown, pro- and mesotibiae and all tarsi usually lighter than remainder of leg. Middle tibiae with at least one anterodorsal and two subapical bristles. Hind femora with two anterodorsal bristles, below usually with four or fewer prominent spines on basal half. Hind tibiae with two anterodorsal bristles and one longer subapical anteroventral.

Abdomen yellow to black, often darker than thorax, yellow to brown pollinose; abdominal hairs yellow to brown. Genitalia as figured (Figures 17, 34).

Type locality and type: New York. Type No. 1114 in Museum of Comparative Zoology, Harvard University. Two female specimens examined by Mr. George Steyskal.

Distribution: Ontario, Quebec, Minnesota, Wisconsin, Michigan, Ohio, Pennsylvania, Massachusetts, New York, Maine, and Northern Illinois and Virginia. Flight period: 25 June to 16 October.

Remarks: This species is closely related to *thoracicus*, but may be separated by the wider marginal cell, more rounded stigma and fewer ventral bristles on the basal half of the hind femora.

This species has been taken in forest vegetation, in a tamarack bog, and at lights. 185 specimens were examined.

Syneches thoracicus (Say)
Figures 1, 4, 9, 51

Hybos thoracicus Say, 1823, Jour. Nat. Sci. Phil. 3: 76.

Gloma phthia Walker, 1849, List Dipt. Brit. Mus. 3: 492. (NEW SYNONYM)

Syneches testaceus Melander, 1928, Genera Insectorum. Fasc. 185: 44. (NEW SYNONYM)

Head reddish brown to black, grey pollinose; posterior ocellar depression present. Two long and two or four shorter ocellar bristles. Antennae yellow to brown, arista densely pubescent except for apex.

Thorax yellow to black; lighter specimens may have one to three dark longitudinal mesoscutal integumental stripes; uniformly golden to brown pollinose. Three, rarely five, small humeral bristles; two notopleurals, posterior longer; one long and two minute postalars. Pleurae gold to brown pollinose except for large polished spot on sternopleuron and mesopleuron. Halteres yellow to black, stem sometimes lighter.

Wings 4-5 mm. in length, subhyaline to dark grey or brown, stigma elongate oval, pale yellow to black, sometimes nearly filling apex of marginal cell. Second vein gently curved before end of first vein; third and fourth veins nearly parallel beyond discal cell. Marginal cell one to two times as wide as submarginal cell at end of first vein.

Legs from yellow to dark brown; pro- and mesotibiae and all tarsi usually lighter than remainder of leg. Middle tibiae with at least one long anterodorsal and two subapical bristles. Hind femora with two to four anterodorsal bristles, below usually with more than five prominent spines on basal half. Hind tibiae with two anterodorsal bristles and one or two subapical anteroventrals.

Abdomen yellowish to black, often darker than thorax, brown to gold pollinose; abdominal hairs yellow to brown. Genitalia as figured (Figures 1, 4).

Type locality and type: Pennsylvania. Holotype lost.

Distribution: Ontario, Quebec and Maine south to Arkansas, Alabama and Georgia and west to Kansas and Nebraska. Flight period: 14 May to 14 August.

Remarks: This species may be distinguished from *rufus*, the most closely related species, by the presence of an elongate oval stigma, a narrower marginal cell, and more ventral spines on the basal half of the hind femora.

643 specimens of this species were examined.

The name *phthia* has, since 1928, been used incorrectly in place of *simplex*. Examination of a photograph of the wing of the type of *phthia* has proven that this insect is actually *thoracicus* (see detailed note under *simplex*).

S. thoracicus is an extremely variable species, especially in wing characters which are usually very stable in species of *Syneches* (stigma, shape and color, shape of marginal cell). Melander described *testaceus* from a single female, using characters such as the stigma and the marginal cell. Examination of the holotype from Kansas City, Missouri, and several male specimens from the same general area which fit the description has shown *testaceus* to be within the range of variation of *thoracicus*.

The feeding habits of this species were observed in Stewart Co., Tennessee, 9-10 June, 1971, by the writer. They are very similar to the predaceous behavior of an unidentified species of this genus described by Schwartz in 1891.

Numerous *S. thoracicus* were observed resting on the undersides of leaves during the day in the forest. Towards dusk the insects began to fly singly in rectangular patterns near clumps of vegetation at varying heights. Occasionally one of the flies was observed to dart into vegetation and capture a minute insect with its powerful hind legs. It then flew, oriented in a vertical position, prey still trapped in the hind legs, to a nearby leaf and without alighting caught on to its edge with the tarsal claws of one of the fore legs. The fly, still suspended by one leg, then manipulated the prey with the remaining legs, inserted its mouthparts and sucked out the fluids.

When disturbed or when finished with the prey (usually one to three minutes), the fly dropped the insect and again flew to rest on the underside of a leaf. Both sexes

were observed feeding in this manner, but despite the density of the insects, no mating behavior was observed. Schwartz also reported a high density of the species he observed.

Schwartz makes the statement, "The long and very sharp claws are well adapted for taking a firm hold on the surface of the leaf, and the long pulvilli assist in the operation by pressing on the edge or the underside of the leaf." One might assume that since all *Syneches* have long curved tarsal claws and large pulvilli (Figure 12), they all have this type of feeding behavior.

Syneches inversus Curran

Figures 3, 28, 48

Syneches inversus Curran, 1928, Ent. Bull. Dept. Agric. Jamaica 4: 35.

Head blackish, grey pollinose; posterior ocellar depression present. Two long and four short ocellar bristles.

Thorax brown pollinose on the anterior two thirds, except the broad sides, elsewhere above and on the pleura, greyish; black from dorsal view. Pleurae grey pollinose, posterior half of sternopleura and mesopleura polished below. Four weak humeral bristles; one notopleural, one supraalar; one long and three short postalars. Halteres yellow.

Wings 4.5 mm. in length, light brown, darker apically, stigma elongate, dark brown. Second vein not curved below end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell at end of first vein subequal to submarginal cell at same point.

Legs: Front and middle legs yellowish, coxae and trochanters brown; hind legs reddish. Anterior tibiae with several bristles above in two rows; middle tibiae with a long posterodorsal bristle at the basal fourth and three to four ventral bristles on the apical half; hind femora with two long, strong anteroventral bristles near the middle and several shorter bristles toward the base; on the apical half below with about eight short, stout apically inclined spines; posterior tarsi with a row of four anteroventral bristles on the swollen first segment; hind tibiae enlarged apically.

Abdomen brown, first segment slightly darker, pale pollinose; abdominal hairs pale. Genitalia as figured (Figures 28, 48).

Type locality and type: Jamaica, Cinchona. Deposited in British Museum (Natural History).

Records: JAMAICA. 1♂, Cinchona, 25 August 1923. 2♂♂, 6 miles N. Mavis Bank, 2 June 1966 (Byrd K. Dozier).

Remarks: This species can be distinguished from all other West Indian *Syneches* by the presence of an elongate, indistinct stigma and a swollen, spinose basitarsus.

One of the two specimens of this species examined was compared with the holotype in the British Museum (Natural History) by Mr. Kenneth G. V. Smith.

Syneches pallidus n. sp.
Figures 13, 22, 47, 62

Head black, grey pollinose; posterior ocellar depression present. Two long and four short ocellar bristles. Antennae yellow, third segment with fine golden pubescence; arista more than six times length of third antennal segment, dark, finely pubescent except for apex.

Thorax with anterior half of notum brown with three longitudinal yellow integumental stripes; posterior half yellow to white, very pale pollinose throughout. Six weak humeral bristles; one notopleural, one supraalar; one long and several short postalars. Pleurae pale pollinose except for large polished area of sternopleuron and mesopleuron. Halteres pale brown, stem whitish.

Wings 5-5.5 mm. long, pale brown, stigma dark brown, rectangular. Second vein curved slightly before end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell at end of first vein subequal to submarginal cell at same point.

Legs from nearly white to pale tan except for brown median band and apex of hind femora, median band of middle and hind tibiae and hind tarsi. Front tibiae with four to six prominent dorsal bristles. Anterodorsal bristle of middle tibiae slightly shorter than length of basitarsus, ventral apical bristle markedly shorter. Hind femora with five to six anterodorsal bristles along entire length; below with numerous strong spines, two anteroventrals evidently longer than others. Several apical bristles slightly differentiated. Hind basitarsus slightly swollen and spinose on anterior edge.

Abdomen pale brown, pale pollinose; abdominal hairs pale. Genitalia as figured (Figures 22, 47).

Types: *Holotype*. —♂, Jamaica, Hardwar Gap, 4000 ft., 13 July 1966 (Howden and Becker). Type No. 12692 in Canadian National Collection.

Allotype. —♀, same data as holotype, (CNCI).

Paratypes. — Same data as holotype with following dates: 1♂, 1♀, 13 July 1966; 1♀, 6 July 1966; 3♀♀, 25 July 1966. 1♀, Try. Good Hope, 8 August 1966 (Howden and Becker). Paratype distribution: 1♂, 1♀, (USNM); 1♀, (MSUC); 1♀, (IJSN); remainder in CNCI.

Remarks: This species is readily distinguished from other West Indian species by the combination of large size, pale color and conspicuously banded legs.

All specimens examined had apparently been treated by some method, prior to mounting, which resulted in fading. Certain artifacts of this fading were ignored in the description, such as the partially whitened stigma, which is almost certainly absent in specimens which have not been processed in this manner. The colors of the faded fly, however, are those given in the description.

Syneches macrochaetus n. sp.
Figures 12, 31, 39, 53

Head dark brown, grey pollinose; posterior ocellar depression present. Two long and two short ocellar bristles. Antennae dark brown, third segment with inconspicuous pale pubescence; arista more than five times length of third antennal segment, dark, finely pubescent except for apex.

Thorax light brown to brown; anterior half of mesonotum brown pollinose except for two longitudinal stripes and three lateral spots which are grey pollinose; posterior half grey pollinose with brown pollen at base of bristles. Pollen on prescutellar triangle flattened, the spot contrasting with rest of notum when viewed from different aspects. Integument of postalar calli lighter than that of notum, pollinosity similar. Five weak humeral bristles; one notopleural, one supraalar; four postalars, one longer than supraalar and three very weak. Pleurae pale pollinose except for large polished area on sternopleuron and mesopleuron. Halteres brown, stem white to yellow.

Wings 3.5-4mm. in length, light brown, stigma dark brown, rectangular, with a hyaline area at its apex. Second vein nearly straight beneath end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell one and one half to two times as wide as submarginal cell at end of first vein.

Legs: Front and middle legs yellow to light brown except for dark distitarsus and rarely dark middle tibia; hind legs dark brown except for yellowish trochanters and femoral and tibial bases. Front tibiae with three to four prominent dorsal bristles; anterodorsal and ventral bristles of middle tibiae both subequal to length of tibia; apical posteroventral bristle markedly shorter. Hind femora with two to three short anterodorsal bristles, below with abundant short and two to four long posterodorsal spines. Hind tibiae tuberculate ventrally with two anterodorsal bristles of varying lengths, apical posterodorsal stout but very short. Hind basitarsus slightly swollen; spinose on anterior edge.

Abdomen brown, occasionally first three segments yellow; brown to pale pollinose; abdominal hairs brown. Genitalia as figured (Figures 31, 39).

Types; Holotype. —♂, Puerto Rico, Maricao LT, July 1960 (J. Maldonado C.) Type No. 72142 in USNM.

Allotype. —♀, same data as holotype. (USNM)

Paratypes. — 61♂, 11♀, same data as holotype. 1♂, Caribbean N. For., Toro Negro Unit Road No. 564, K.4.8., 2870 ft. alt., Dona Juana Forest on vegetation on forest floor, 17 August 1965, 18°9'N, 66°29'W. (S. Medina Gaud); 1♀, K.5.7., 2880 ft. alt., 17 August 1965 (S. Medina Gaud). 1♂, Barranquitas, Orocovis Road No. 143, K.2.7., on mixed vegetation by roadside, 17 August 1965 (S. Medina Gaud). 1♀, Luquillo Forest, El Yunque Biol. Sta., Molindero Road, elevation 2100 ft., at black light, 2 Jan. 1963 (Paul and Phyllis Spangler). Paratype distribution: 5♂♂, 5♀♀, (CNCI); 3♂♂, 3♀♀ (MSUC); 3♂♂, (ISUI); 3♂♂, 3♀♀, (IJSN); 1♂, 1♀, (BMNH); remainder in USNM.

Remarks: This species is easily distinguished from all other West Indian *Syneches* by the long setae on the middle tibiae.

Syneches debilis Coquillett

Figures 6, 25, 42, 58

Syneches debilis Coquillett, 1895, Proc. U.S. Natl. Mus. 18: 436.

Head dark reddish brown, grey pollinose; posterior ocellar depression and posterior ocellar polished band present. Two long and two short ocellar bristles. Antennae dark brown to black, arista usually black, apex sometimes yellow, apparently bare, about ten times length of third antennal segment.

Thorax light brown to yellow, golden pollinose. Thorax may be marked with dark integumental median longitudinal stripe, notopleural spot, prescutellar longitudinal stripe and humeri. Five, rarely six humeral bristles; two stout subequal notopleurals; three postalars, one long and two minute. Pleurae yellow to dark brown with sparse golden pollen, most of sternopleura and mesopleura polished. Halteres dark brown to black, stem yellow.

Wings 3 mm in length, pale brown, stigma, if visible, light brown, indistinct. Second vein curved beneath end of first vein; third and fourth veins parallel to slightly converging beyond discal cell. Marginal cell at end of first vein as wide as submarginal cell at same point.

Legs light brown to yellow; apex of hind femora, middle of hind tibiae, hind basitarsi and middle and hind distitarsi dark brown to black. Middle tibia with strong black anterodorsal at basal fourth; subapical posteroventral shorter than anterodorsal, yellow. Hind femora with four to five anteroventral bristles; hind tibia with two dark anterodorsal bristles, at least one of which is longer than anteroventral femoral bristles. Hind tibia slightly swollen at apex.

Abdomen light brown to black, brown pollinose, first segment with greyish pollen; abdominal hairs golden to brown. Genitalia as figured (Figures 25, 42).

Type locality and type: *Holotype*. —♂, Washington, D.C. Type No. 3239 in U.S. National Museum.

Distribution: New Jersey, Maryland, Washington, D.C., Virginia, Florida, Georgia.

Remarks: This species can be distinguished from most North American species by its small size, and from other small species (*pusillus*, *vittatus*, *vineus*) by the light thoracic color. It differs from *bacis*, which keys to *debilis* in Melander (1902), in not having a well-defined oval stigma.

70 specimens of this species were examined.

Syneches bacis (Walker)

Figure 64

Platypalpus bacis Walker, 1849, List. Dipt. Ins. in Brit. Mus. 3: 510.

Head dark brown, grey pollinose; posterior ocellar depression present. Two long and two shorter ocellar bristles. Antennae yellow, apical segment and arista brown.

Thorax yellow, golden pollinose. Three humeral bristles; one notopleural, one supraalar; one long and two shorter postalars. Pleurae pale pollinose, subshining; parts of sternopleuron and mesopleuron polished.

Wings 3.25 mm. in length, hyaline with a well-defined oval stigma. Second vein nearly straight beneath end of first vein; third and fourth veins parallel.

Legs yellow, hind tibiae brownish at tip. Front tibiae with several prominent bristles; middle tibiae with long anterodorsal at basal third, numerous long ventral and anteroventral bristles on apical half. Hind femora with apparently three anterodorsal bristles, two small bristles visible on posteroventral surface; several weak subapical bristles present on hind tibiae.

Type locality and type: *Holotype*. — Sex uncertain, Jamaica, (P. H. Gosse). Type in British Museum (Natural History).

Remarks: This species can be distinguished from other West Indian *Syneches* by the combination of yellow thorax; entirely yellow legs, except for tip of hind tibiae; and the presence of a well-defined oval stigma.

The type of this species is damaged, the abdomen is missing as are three of the legs and the wings. The only hind leg is glued to part of the mount in such a manner that the anterior and ventral surfaces are obscured. Figure 64 is a photograph of the wing of the holotype, according to Mr. K. G. V. Smith. Mr. Smith most kindly allowed the writer to examine the type.

Also present on the pin is a Syrphid, *Mesograpta arcifera* Loew, presumably taken as prey. This seems unlikely, however, since the prey is much larger than that usually taken by *Syneches* of even larger size than *bacis*.

Syneches quadrangularis Wheeler and Melander

Syneches quadrangularis Wheeler and Melander, 1901, Biol. Cent. Am., Dipt. Suppl., p. 374.

Head dark reddish brown, grey pollinose; posterior ocellar polished band present. Two long and two shorter ocellar bristles. Antennae brown, arista six times length of third antennal segment.

Thorax brown with two light brown longitudinal mesoscutal stripes on anterior third; yellow pollinose; integument of humeri and postalar calli yellow. Three humeral bristles; two subequal notopleurals; one long and two minute postalars. Pleurae brown, nearly black at bases of legs, grey pollinose. Halteres brown, stem yellow.

Wings hyaline, stigma dark brown, quadrate. Marginal cell not widened at the stigma; third vein not rigidly straight.

Legs yellow, hind femora, tibiae and basitarsi brown apically. Middle tibiae with brown dorsal bristle on basal third and one yellow apical bristle.

Abdomen dark brown, brown pollinose; abdominal hairs brown.

Type locality and type: *Holotype*. —♂, Tabasco, Mexico. Type in British Museum (Natural History).

Remarks: This species can be easily distinguished from all other North American *Syneches* by the combination of brown thoracic color and the presence of a distinct quadrate stigma.

This description was made after examination of the holotype, generously loaned to the writer by Mr. K. G. V. Smith. The specimen, however, was damaged, having neither hind legs nor wings. Several other important features were also obscured or missing. Melander's description (1902) served as a basis for describing missing or obscured characters.

Syneches pusillus Loew
Figures 2, 26, 40, 56

Syneches pusillus Loew, 1861, Berl. Ent. Zeitsch. 5: 320.

Head dark reddish brown, grey pollinose; posterior ocellar polished band present. Two long and two shorter ocellar bristles. Antennae yellow to black, third segment pubescent, arista five to ten times length of third antennal segment.

Thorax brown to black; brown or brown and grey pollinose; integument of humeri and postalar calli sometimes lighter than that of rest of notum, pollinosity similar throughout. Usually more than four humeral bristles; two notopleurals, posterior usually longer; three postalars; one long and two minute. Pleurae pale brown and/or grey pollinose, sternopleura and anterior strip of mesopleura polished. Halteres dark brown to black, stem yellowish.

Wings 2.5-3.5 mm. in length, hyaline to light brown, stigmal area of marginal cell rarely darker than rest of wing. Second vein straight beneath end of first vein; third and fourth veins nearly parallel beyond discal cell. Width of marginal cell at end of first vein subequal to width of submarginal cell at same point.

Legs varying in color from a uniform brown to black with yellow pro- and mesotarsi, bases and apices of metatibiae, and middle three segments of metatarsi. Middle tibiae with dorsal bristle on basal third. Three, rarely more, ventral hair-like bristles on apical two thirds of hind femora; tibia with anterodorsal bristle at one-half its length; one long pale subapical and numerous small apical bristles.

Abdomen brown to black; brown or grey and brown pollinose; abdominal hairs dark. Genitalia as figured (Figures 26, 40).

Type locality and type: Type No. 1113 in Museum of Comparative Zoology, Harvard University. Loew stated he had both sexes, but according to Mr. George Steyskal, who kindly examined the types, no abdomens remain on the two specimens. One label reads "Chicago, Ill., Loew"; and the other, "N. W., Loew."

Distribution: Ontario and Maine south to Florida, west to Louisiana, Arkansas, Kansas, Nebraska and South Dakota. Flight period: southern parts of range, January to July; northern parts of range, May to September.

Remarks: This species is very close to *ater* Melander, differing mainly by the smaller size, lighter wings and longer arista. It can be separated from *vineus* by the straight second vein and from *vittatus* n. sp. by the absence of banding on the abdomen.

173 specimens of *pusillus* were examined. A majority of the western specimens differ from those farther east by the color of the legs. Western specimens have femora and tibiae nearly black and all tarsi entirely yellow; eastern specimens almost always have brown femora and hind basitarsi.

Syneches ater Melander
Figures 7, 21, 35, 60

Syneches ater Melander, 1928, Genera Insectorum 185: 40.

Head dark reddish brown to black, grey pollinose; posterior ocellar polished band present. Two long and two shorter ocellar bristles. Antennae dark brown to black, third segment pubescent, arista bare, not more than five times length of third antennal segment.

Thorax dark brown to black; brown or brown and grey pollinose; integument of humeri and postalar calli sometimes lighter than that of rest of notum, pollinosity similar throughout. Three to five, rarely more, humeral bristles present; two notopleurals; posterior usually longer; three postalars, one long and two minute. Pleurae pale brown and/or grey pollinose, sternopleuron partly polished. Halteres dark brown to black, stem yellowish.

Wings 3.5-4 mm. in length, pale to dark brown, stigmal area of marginal cell darker than rest of wing. Second vein straight beneath end of first vein; third and fourth veins nearly parallel beyond discal cell. Marginal cell usually slightly wider than submarginal cell at end of first vein.

Legs brown, hind legs darker; tarsi, bases and apices of tibiae, middle segments of tarsi usually lighter, brown to yellow. Middle tibiae with dorsal bristle on basal third. Two or three, rarely more, ventral hair-like bristles on apical two thirds of hind femora; tibiae with anterodorsal bristle on apical half, one pale subapical and numerous small apical bristles.

Abdomen dark reddish brown to dark brown, brown or grey and brown pollinose; abdominal hairs dark. Genitalia as figured (Figures 21, 35).

Type locality and type: *Holotype*. —♂, Pennsylvania, Hazleton, Luzerne Co., 28 June 1912 (Dr. Deitz). Type in U.S. National Museum.

Records: NOVA SCOTIA. 1♂, Lockeport, 28 July 1958 (J. R. Vockeroth). NEWFOUNDLAND. 1♂, Terra Nova National Park, 7 July 1961 (C. P. Alexander). ONTARIO. 1♂, Mer Bleu, 5 mi E. Ottawa, 19 June 1966, Malaise trap (D. D. Munroe); same locality with following dates: 3♂♂, 4♀♀ 25 June 1966; 1♂, 4♀♀ 27 June 1966; 1♀, 1 July 1966; 1♂, 2♀♀, 5 July 1966; 2♀♀, 7 July 1966; 2♀♀, 11 July 1966; 1♀, 19 July 1966. 2♂♂, 2♀♀, Ottawa, 4 July 1964 (J. R. Vockeroth). MAINE. 2♂♂, 2♀♀ Mt. Desert Island, Hancock Co., 16 July 1963 (J. S. Naeger). 1♀, Fort Kent, Aroostook Co., 19 Aug. (A. L. Melander). MASSACHUSETTS. 1♀, Athol, Worcester Co., 13 July 1933 (A. L. Melander). CONNECTICUT. 2♀♀, Storres, Tolland Co., 6 July 1931 (A. L. Melander). NEW YORK. 1♂, Lynbrook, Nassau Co., 24 July 1959 (G. C. Eickwort). 1♀, Zurich Bog, Wayne Co., 25 July 1964 (L. L. Pechuman). 1♀, Orient, Long Island, Suffolk Co., 5 July 1952 (R. Latham). 1♂, 1♀, Babylon, Suffolk Co., 16 June 1934 (Blanton and Borders). 1♂, Ellis, Slaterville, 13 June 1904. NEW JERSEY. 2♂♂, Lakehurst, Ocean Co., 26 June 1931 (A. L. Melander). MARYLAND. 1♂, College Park, Prince Georges Co., 28 July 1935 (C. T. Greene). MINNESOTA. 1♂, Q-S WRC, T46N R10W Sec. 9, Basswood Lake, Lake Co., 18 July 1952 (E. McConnell).

Remarks: This species is very close to *S. pusillus* and can be distinguished only by the larger size, slightly darker wings and shorter arista. All of these characters overlap with *pusillus*, and in transitional areas, Michigan and Pennsylvania, the two species are nearly indistinguishable.

At the beginning of this study, it was hypothesized that *pusillus* and *ater* were simply different variations of the same species, and that Melander, looking at one very dark insect, had erroneously considered it distinct.

The length of the arista was the most concrete and easily measurable character. The antennae of 17♂♂ and 17♀♀ of *ater* and an equal number of *pusillus* were removed and mounted on slides. The lengths of the third antennal segment and of the arista were measured for each specimen and recorded along with a measurement of wing length. All measurements overlapped between the two species.

A statistical test could not be run on arista length alone because specimens of *ater* were, in general, larger in body size than those of *pusillus*, and arista length varied to some degree with body size. A ratio of arista length to third antennal segment length was chosen because the length of the third antennal segment varies directly with size of the insect.

The ratio varied from 3.5 to 5.0 in *ater* and from 5.0 to 10.0 in *pusillus*. A Student's T-test was run on the sets of ratios and a t-value of 10.01 obtained. This is significant at the .1 percent level.

On the basis of these data, it was concluded that *ater* and *pusillus* are distinct, and nearly always separable on the basis of a combination of color, size and ratio of the arista to the third antennal segment length.

Syneches vittatus n. sp.
Figures 16, 32, 38, 55, 61

Head black, grey pollinose; posterior ocellar depression and posterior ocellar polished band present. Two long and two shorter pale ocellar bristles. Antennae dark brown to black, arista bare.

Thorax brown to black, greyish pollinose, variously marked with brown pollinose patches; brown pollen always present at bases of dorsocentral bristles. Humeral bristles variable, usually more than six; two notopleurals, posterior longer; one long and two shorter postalar bristles. Pleura greyish pollinose except for polished spot on sternopleuron. Halteres brown to black, stem usually lighter.

Wings 3 mm. in length, subhyaline to hyaline, stigma absent. Second vein curved beneath end of first vein; third and fourth veins parallel beyond discal cell. Marginal cell at end of first vein about half as wide as submarginal cell at same point.

Legs brown; coxae, trochanters, femora and sometimes tibiae quite dark. Dorsal bristle on basal third of middle tibiae small, subapicals pale and subequal to dorsal bristle. Hind femora with pale hairs below; anterodorsal on basal half of hind tibiae barely differentiated; two subapicals present.

Abdomen dark brown to black, brown pollinose, posterior band on each abdominal segment grey pollinose; abdominal hairs pale. Genitalia as figured (Figures 32, 38).

Types: *Holotype*. —♂, Arizona, Cochise Stronghold, Dragoon Mts., Cochise Co. 29 June to 2 July, 1970, U.V. Light trap (R. J. Shaw). Type deposited in University of Arizona Insect Collection.

Allotype. —♀, same data as holotype. (UAIC).

Paratypes. —1♀, same data as holotype. Others with following dates: 1♀, 29 June to 2 July 1970; 2♀♀, rain during nights 20, 21, 18-21 July 1970; 1♀, July 31-Aug. 2, 1970. 2♂♂, 1♀, Pena Blanca, Santa Cruz Co., 10 July 1961, U.V. Light trap (Werner, Nutting). 3♂♂, 4♀♀, Patagonia Mountains, Santa Cruz Co., 5500 ft., 10 July 1962 (H. E. Milliron); 1♂, 6000 ft., 11 July 1962. 1♂, 2♀♀, Chiricahua Mts., Cochise Co., 4 July 1940 (D. E. Hardy and R. H. Beamer). 1♂, 1♀, Sunnyside Canyon, Huachuca Mts., Cochise Co., 9 July 1940 (D. E. Hardy and R. H. Beamer). Paratype distribution: 2♂♂, 3♂♂, (KSUC); 1♂, 1♀, (MSUC); 4♂♂, 2♀♀, (CNCI); 2♂♂, 2♀♀, (USNM); remainder at UAIC.

Remarks: This species can be distinguished from all other North American *Syneches* by the banded abdomen and the narrow marginal cell.

Syneches vineus n. sp.
Figures 5, 29, 43, 50

Head black, greyish pollinose; posterior ocellar depression present; posterior ocellar polished band wide. Two long and two shorter ocellar bristles. Antennae black; arista bare.

Thorax: Notum black, shining, sparsely covered with long brown pollen. Two to four humeral bristles; two notopleurals, posterior distinctly longer; one long and two shorter postalars. Pleurae dark brown, brown pollinose, sternopleuron and mesopleuron largely polished. Integument of postalar calli and a small posterior humeral spot light brown to yellow. Halteres black, stem lighter.

Wings 3 mm. in length, grey to hyaline; stigma absent to dark grey. Second vein with a long gentle curve below end of first vein; third and fourth veins slightly convergent beyond discal cell. Marginal cell at end of first vein distinctly narrower than submarginal cell at same point.

Legs dark brown to black; front and middle tibiae and tarsi yellow; bases and apices of hind tibiae and middle three tarsal segments yellow; hind basitarsi and all distitarsi brown. Dorsal bristle on basal third of middle tibia longer than notopleurals; one pale ventral subapical, subequal to dorsal bristle. Hind femora not swollen, below with one hair-like bristle and one or two long hairs. Anterodorsal bristle on basal half of hind tibiae subequal to ventral femoral bristle; two subapicals, one pale, both slightly shorter than anterodorsal. Hind basitarsus with two subapical hair-like bristles.

Abdomen dark brown to black, shining; pollen brown, sparse; abdominal hairs black. Genitalia as figured (Figures 29, 43).

Types: *Holotype*. —♂, Dominica, W. I., Fond Figues R., Rain forest, 9 Feb. 1965 (W. W. Wirth). Type No. 72170 in U.S. National Museum.

Allotype. —♀, same data as holotype.

Paratypes. — Same data as holotype with following dates: 4♂, 2♀, 9 Feb. 1965, 3 Feb. 1965; 1♀, 25 Jan. 1965; 2♀, 9-12 March 1965; 2♀, Fond Figues R. 400', 29 April 1966 (R. J. Gagne); 1♂, 12 April 1966. Pt. Mulatre, 15 Sept. 1966 (D. L. Jackson). 1♀, Pont Case, 20 Sept. 1965 (D. L. Jackson). 1♂, Clarke Hall, Cocoa Trail, 18 Jan. 1965 (W. W. Wirth). 1♂, trail, 1 mi. n. junc. rds. to Rosalie and Castle Bruce, 1300', 29 March 1966 (R. J. Gagne). 1♀, 5 mi. e. Pont Casse, 11 April 1966 (R. J. Gagne). 1♀, 2 mi. e. Pont Casse, 6 May 1966 (R. J. Gagne). Paratype distribution: 1♂, 1♀, (CNCI); 1♂, 1♀, (MSUC); 1♂, 1♀, (IJSN); remainder (USNM).

Remarks: This species can be distinguished from other West Indian *Syneches* by the small size and dark body color. It can be separated from *vineus jamaicensis* n. ssp. and from *vineus medinai* n. ssp. by the presence of a distinct grey stigma and long subapical bristles on hind basitarsus.

Syneches vineus medinai n. ssp.

Figures 23, 44, 61

Morphologically very similar to *S. vineus vineus*, differing in the following characters: Wings hyaline, stigma absent. Thoracic pollen sometimes greyish on posterior third of notum; posterior notopleural bristle only slightly longer than anterior. Legs light brown, front and middle tibiae and tarsi yellow; hind legs yellow except for brown coxae, trochanters, and apical third of hind femora; all distitarsi brown. Hind basitarsus without subapical bristles. Apical margin of hypandrium convex (Figure 44).

Types: Holotype. — ♂, Puerto Rico, Caribbean N. For. Toro Negro Unit Rd. No. 564, K.5.7., 2880 ft. alt., Dona Juana Forest at entrance to recreation area, 18°8'N, 66°30'W, 17 Aug. 1965 (S. Medina Gaud).

Paratypes. — 1♂, same data as holotype; 1♂, Caribbean N. For. Toro Negro Unit Rd. No. 564, K.4.8., 2870 ft. alt., Dona Juana Forest on vegetation on forest floor, 18°9'N, 66°29'W, 17 August 1965 (S. Medina Gaud); 1♂, K.12.6 from Carey on rd. No. 15 to Guayama, swept from grass, 18°2'30"N, 66°7'45"W, 1 Sept. 1964 (S. Medina Gaud and E. Medina). 1♂, Maricao LT., July 1960 (J. Maldonado C.). 1♂, K.22.7 from Carey on road No. 15 to Guayama, on vegetation, mainly *Bidens pilosa*, 80°6'N, 66°9'W (S. Medina Gaud and E. Medina). Paratype distribution: 1♂ in each of the following museums: USNM, CNCI, MSUC, ISUI, and IJSN.

Syneches vineus jamaicensis n. ssp.

Figures 15, 24, 41, 54

Morphologically very similar to *S. vineus vineus*, differing mainly in the following characteristics: Wings hyaline, stigma milky white, probably hyaline. Thoracic pollen greyish on posterior third of notum. Legs yellow to white, probably light brown, distitarsi darker; hind basitarsus without subapical bristles. Hypandrium with a median apical notch (Figure 41).

Types: Holotype. — ♂, Jamaica, Hardwar Gap, 4000 ft., 25 July 1966 (Howden and Becker). Type No. 12693 in Canadian National Collection.

Allotype. —♀, same data as holotype. (CNCI).

Paratypes. — Same data as holotype with following dates: 4♂, 6♀, 25 July 1966; 1♂, 2♀, 6 July 1966; 2♀, 10 July 1966; 4♂, 2♀, 13 July 1966; 3♂, 29 July 1966. Paratype distribution: 2♂, 2♀ (USNM); 1♂, 1♀, (MSUC); 1♂, 1♀, (IJSN); remainder in CNCI.

Remarks: The preceding three insects are morphologically quite similar in many respects. The characters used to separate them, however, might normally warrant placement in separate species. For example, the median apical notch on the epandrium of *jamaicensis* and the absence of this notch on *medinai* appears to be a very constant character; but in *vineus vineus* both the notched and unnotched condition exist. Therefore, without examination of a larger number of specimens, one cannot be certain that the character is constant in *jamaicensis* and *medinai*.

Of the specimens examined, only those of *vineus vineus* were in satisfactory condition. Only five males of *medinai* were examined. Although the series of *jamaicensis* was fairly large, all specimens had been stored or prepared in a manner which caused fading. It is unfortunate that such a process was used on all of the specimens because it caused fading of many body parts and the collapse of certain portions of the thorax. Color patterns could only be inferred by comparison with similarly treated specimens of *ater*.

Because of the larger degree of variation in other *Syneches*, the unsatisfactory condition of the relatively small numbers of specimens and the definite geographical isolation, it seems more reasonable, at this time, to place the three groups at a sub-species level. It is very possible that the three are distinct species, but this cannot be determined until a larger number of specimens in satisfactory condition from these and other islands have been examined to determine the range of variation in each group.

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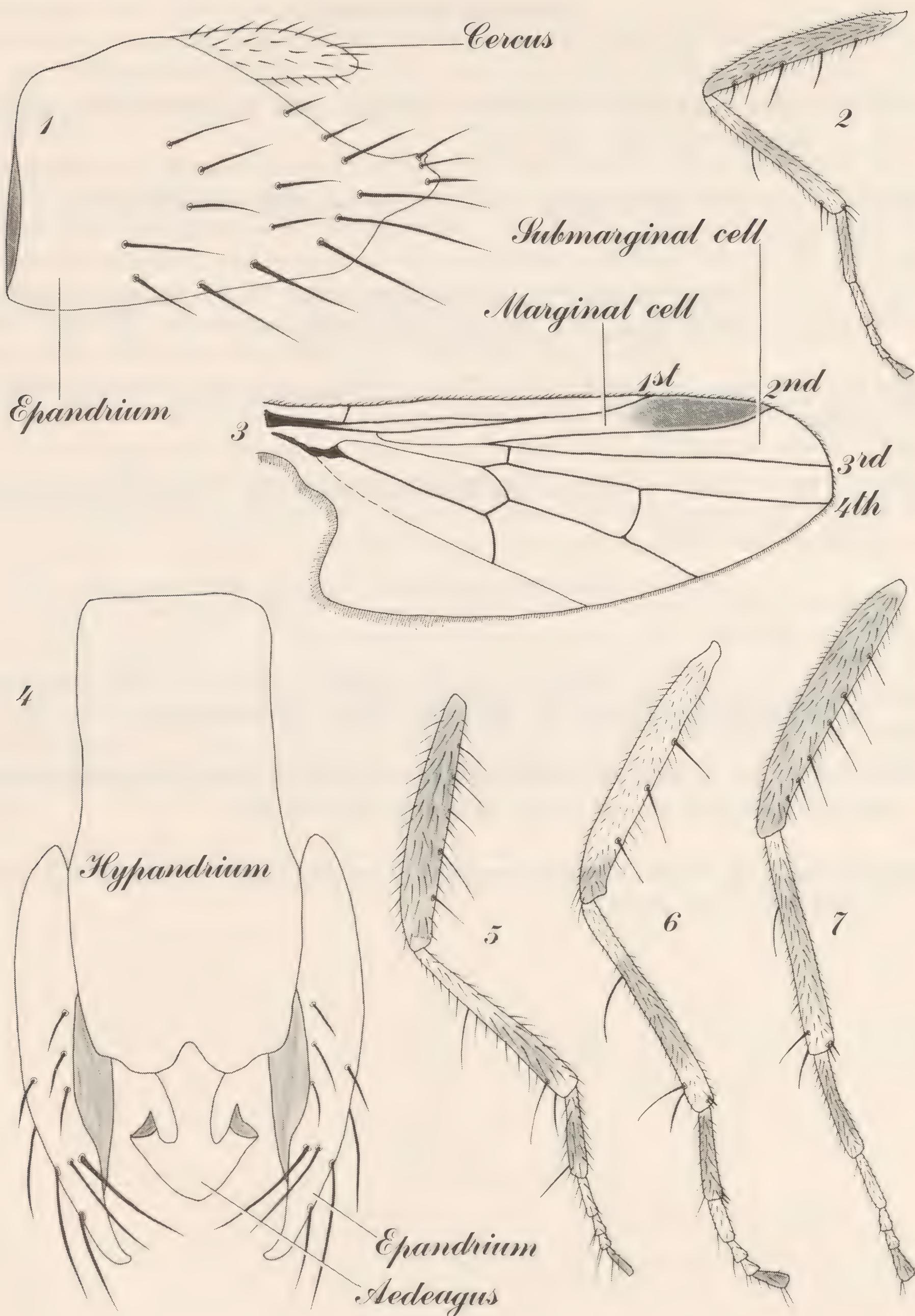


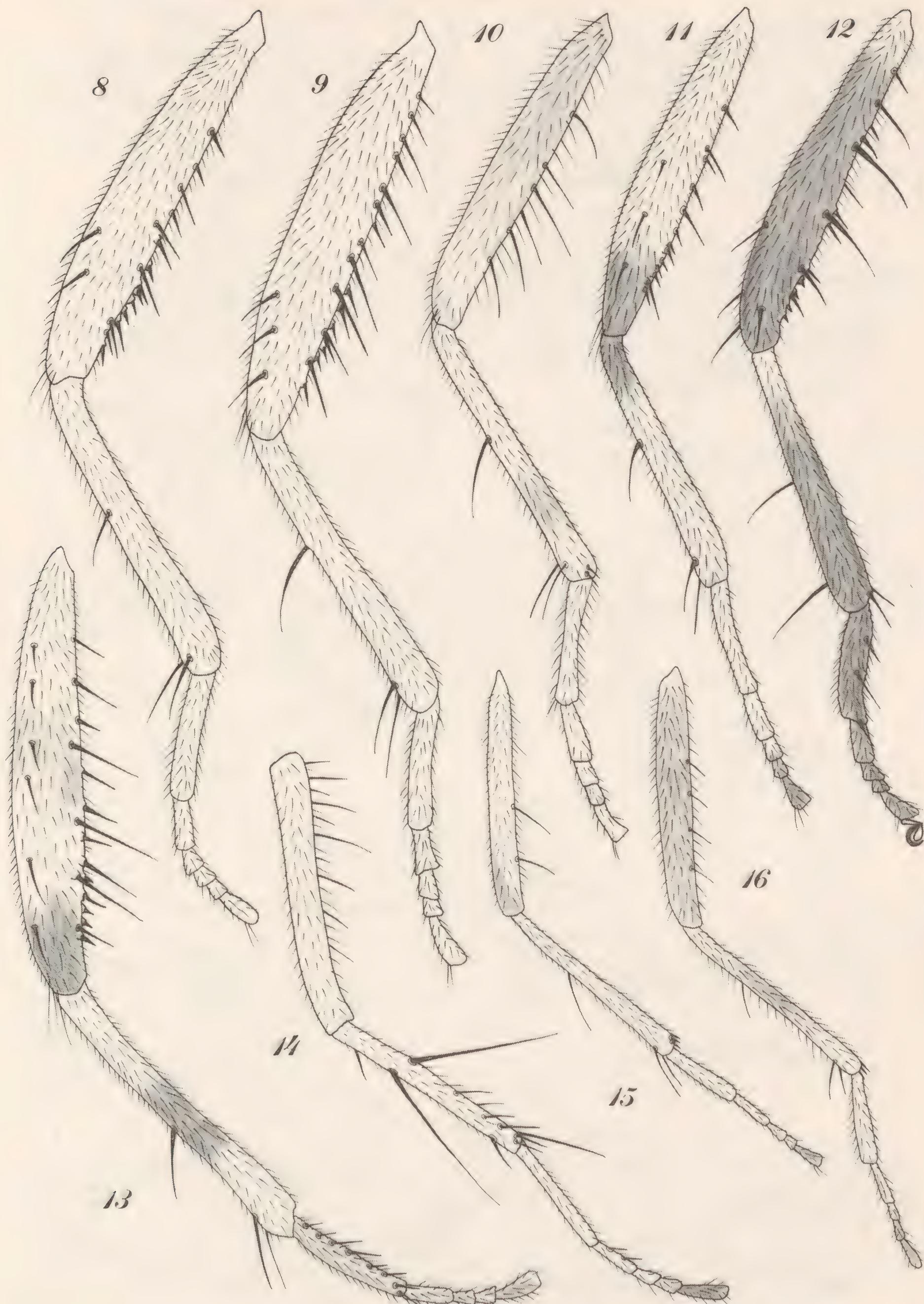
Fig. 1 Epandrium of *Syneches thoracicus* (Say).

Fig. 2. Meta leg of *S. pusillus* Loew.

Fig. 3. Wing of *S. inversus* Curran.

Fig. 4. Hypandrium of *S. thoracicus* (Say).

Figs. 5-7. Metal leg of: *S. vineus vineus* n. ssp. 5; *S. debilis* Coquillett 6; *S. ater* Melander 7.

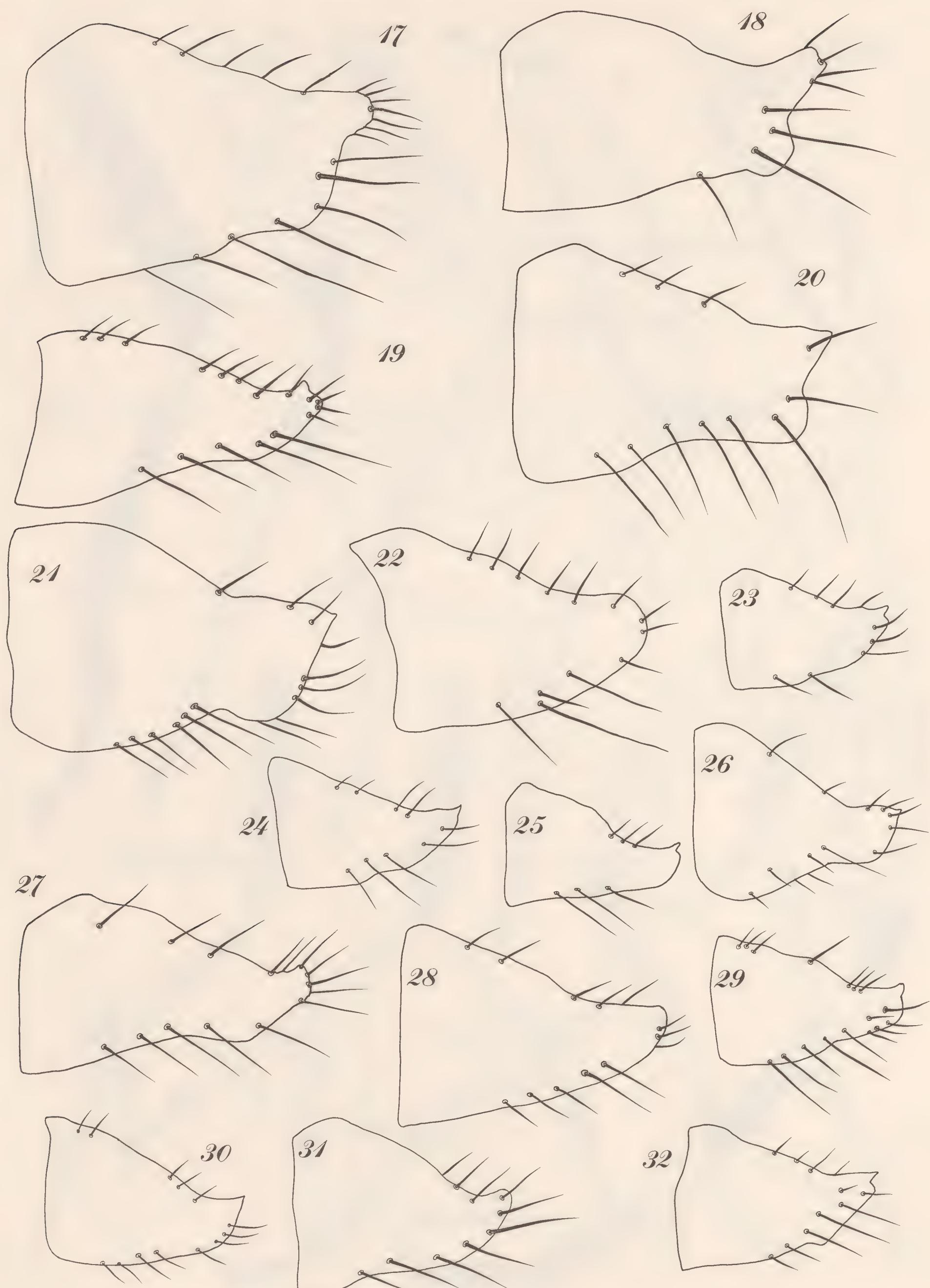


Figs. 8-13. Meta leg of: *Syneches rufus* Loew 8; *S. thoracicus* (Say) 9; *S. simplex* Walker 10; *S. frosti* n. sp. 11; *S. macrochaetus* n. sp. 12; *S. pallidus* n. sp. 13.

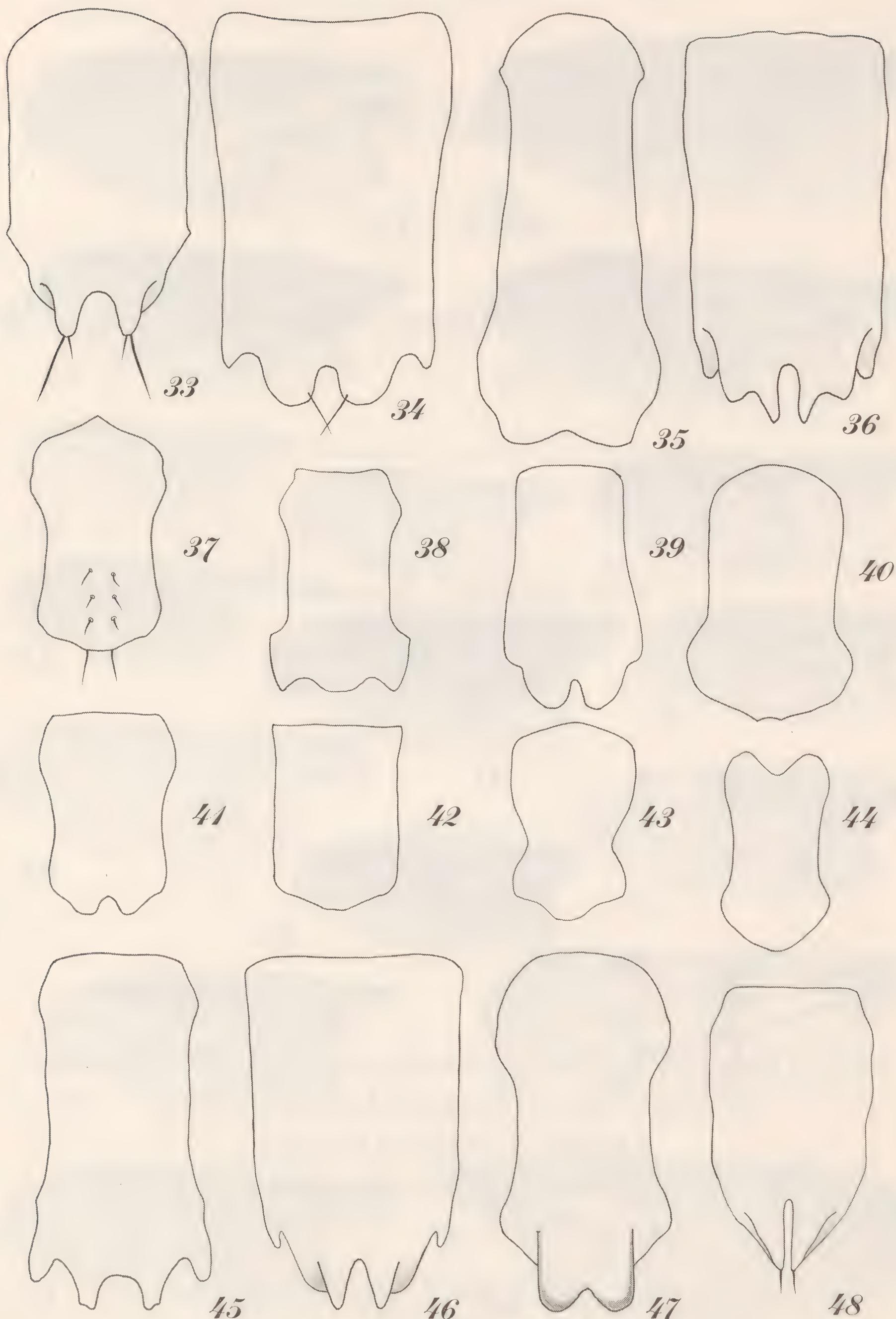
Fig. 14. Meso leg of *S. macrochaetus* n. sp.

Fig. 15. Meta leg of *S. vineus jamaicensis* n. ssp.

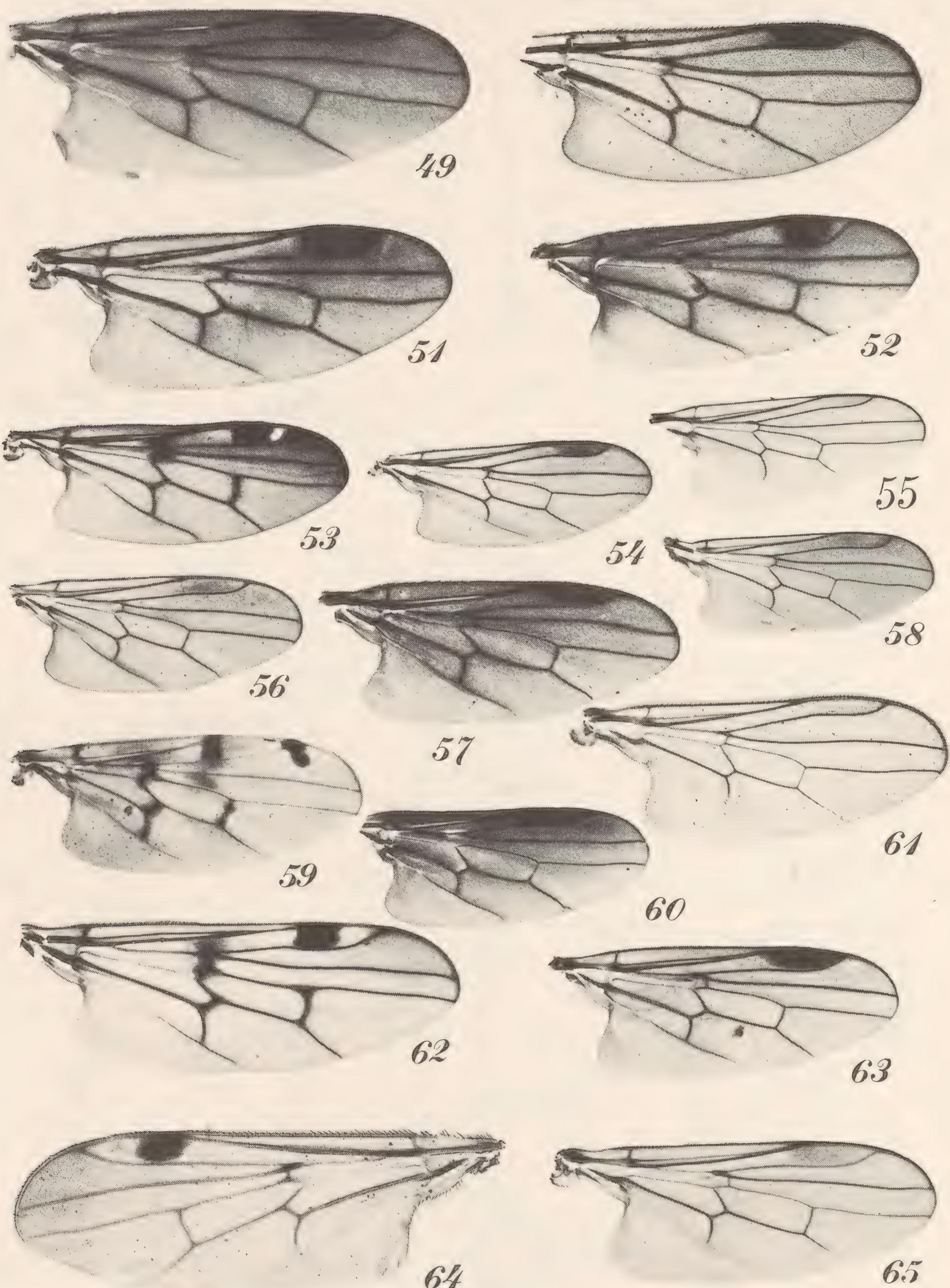
Fig. 16. Meta leg of *S. vittatus* n. sp.



Figs. 17-32. Epandrium of: *Syneches rufus* Loew 17; *S. albonotatus* Loew 18; *S. frosti* n. sp. 19; *S. longipennis* Melander 20; *S. ater* Melander 21; *S. pallidus* n. sp. 22; *S. vineus medinai* n. ssp. 23; *S. vineus jamaicensis* n. ssp. 24; *S. debilis* Coquillett 25; *S. pusillus* Loew 26; *S. hyalinus* Coquillett 27; *S. inversus* Curran 28; *S. vineus vineus* n. ssp. 29; *S. simplex* Walker 30; *S. macrochaetosus* n. sp. 31; *S. vittatus* n. sp. 32.



Figs. 33-48. Hypandrium of: *Syneches albonotatus* Loew 33; *S. rufus* Loew 34; *S. ater* Melander 35; *S. hyalinus* Coquillett 36; *S. simplex* Walker 37; *S. vittatus* n. sp. 38; *S. macrochaetus* n. sp. 39; *S. pusillus* Loew 40; *S. vineus jamaicensis* n. ssp. 41; *S. debilis* Coquillett 42; *S. vineus vineus* n. ssp. 43; *S. vineus medinai* n. ssp. 44; *S. longipennis* Melander 45; *S. frosti* n. sp. 46; *S. pallidus* n. sp. 47; *S. inversus* Curran 48.



Figs. 49-65. Wing of: *Syneches longipennis* Melander 49; *S. vineus vineus* n. ssp. 50; *S. thoracicus* (Say) 51; *S. rufus* Loew 52; *S. macrochaetosus* n. sp. 53; *S. vineus jamaicensis* n. ssp. 54; *S. vittatus* n. sp. 55; *S. pusillus* Loew 56; *S. albonotatus* Loew 57; *S. debilis* Coquillett 58; *S. simplex* Walker 59; *S. ater* Melander 60; *S. vineus medinai* n. ssp. 61; *S. pallidus* n. sp. 62; *S. hyalinus* Coquillett 63; holotype of *S. bacis* (Walker), (not to same scale) 64; *S. frosti* n. sp. 65.